

3.3.3 Project Descriptions

3.3.3.1 City of Key West

Projects included in the Initial Project List for the City of Key West include Stormwater Projects 1 through 89. Each of these projects generally consists of relatively small (averaging approximately \$180,000) improvements such as installing new drainage wells and inlets or treatment structures upstream of outfalls.

3.3.3.2 City of Layton

The service area for this project generally consists of the City of Layton. The project will provide wastewater collection system and a 0.05 mgd BAT wastewater treatment plant.

3.3.3.3 City of Key Colony Beach

This project consists of numerous collection system improvements within the City of Key Colony Beach's wastewater collection and transmission system. Items identified by the City and in their planning document include lining of gravity sewer lines and replacement of the main sewage transmission line that runs from a pump station to the treatment plant.

3.3.3.4 City of Marathon

Marathon II

This project will provide wastewater collection service to "Hot Spot" areas within the Phase II area, and provide initial 1.0 mgd wastewater treatment plant meeting AWT standards expandable to 2.0 mgd for this regional service area. Additionally, this project will include the decommissioning of the Little Venice wastewater plant and connection of its service area to the regional system.

Marathon III

This project will provide wastewater collection service to "Hot Spot" area within the Phase III area. All of the package plants in the Phase III area will be connected to the regional system. The regional wastewater treatment plant will be expanded to 2.0 mgd.

3.3.3.5 Key Largo Wastewater Board

PAED 18 Cross Key Waterway Estates

The service area for this project generally consists of the Cross Key Waterway Estates, Largo Sound Park, Anglers Park Shores, and South Creek Village area along U.S. 1. This project will provide community wastewater collection system with interim 0.140 mgd wastewater treatment plant meeting AWT standards.

PEAD 16 Area A

The service area for this project generally consists of what is known as Area A, and Winken, Blyken & Nod. This project will provide wastewater collection systems to "Hot Spot" areas, and that system will connect to one of two adjacent existing wastewater

treatment plants, each of which appears to have adequate excess capacity to serve this "Hot Spot".

3.3.3.6 Village of Islamorada

Plantation Key Colony Phase IA

This project generally consists expansion of the AWT plant built in Phase I of this project and connection of Plantation Key Elementary School and Coral Shores High School to the expanded plant. Additionally, the project will include decommissioning existing package treatment plants.

Plantation Key Colony Phase II

This project generally consist of expansion AWT plant built in Phase I and Expanded in Phase II to 0.23 mgd, and construction of a vacuum sewer system for the remainder of North Plantation Key Colony from Tavernier to the northeast, High Street to the southeast and Plantation Key Elementary to the southwest.

Plantation Key

This project consists of providing a wastewater collection and treatment system to serve the remainder of Plantation Key. It is anticipated that the required AWT wastewater treatment plant would have an average daily flow of approximately 0.35 mgd.

3.3.3.7 Monroe County

Boca Chica - Big Coppitt

The service area for this project generally consists of Coppitt, Johnsonville, Gulfview Porpoise, Point, Gulfrest Park subdivisions and adjacent area along U.S. 1. The project will provide wastewater collection system to "Hot Spot" areas, and a 0.2 mgd AWT wastewater treatment plant expandable to 0.40 mgd.

Bay Point

The service area for this project generally consists of Bay Point Subdivision and Saddlebunch Shores. The project will provide wastewater collection system to "Hot Spot" areas, and a 0.05 mgd wastewater treatment plant expandable to 0.075 mgd for this service area. Additionally, this project will connect existing package plants to system and upgrade wastewater treatment plant to 0.075 mgd.

Big Pine Regional - Whispering Pines

The service area for this project generally consists of Whispering Pines South, Sands, Grieser, Ross Haven, Pat & Mary's, Big Pine Cove, and the adjacent area along U.S. 1. The project will provide wastewater collection system to "Hot Spot" areas, and an initial 0.30 mgd AWT wastewater treatment plant, expandable to 0.50 mgd for this regional service area.

Big Pine Regional - Doctor's Arm

The service area for this project generally consists of Doctor's Arm, Lambert, Tropical Bay, Palma Villa, and Whispering Pines North Subdivisions. The project will provide wastewater collection system to "Hot Spot" areas.

3.4 Method of Execution

3.4.1 Federal Appropriations

Public Law 106-554, Departments of Labor, Health, and Human Services and Education, and related Agencies Appropriations Act of 2001, Section 109, allocated \$420,000 for the USACE to begin coordination activities with the non-Federal Sponsor and to prepare the PMP (subject document) that defines the program scope, guidelines, schedule and resources required for program implementation. Additionally, monies are being used to prepare the appropriate level of NEPA documentation to evaluate program alternatives and address the impacts of program implementation.

Since the funding stream per year is presently an unknown factor, this PMP has assumed Congressional appropriations of various amounts each year for the next four years to implement the initial projects discussed in Section 3.3. Appropriation assumptions are discussed in Section 4.

3.4.2 Program Implementation Guidance Document

The USACE Headquarters has prepared a Program Implementation Guidance (PIG) document to assist in the implementation of the FKWQIP that contains the following elements:

- Program Objective
- Authority
- Appropriations and Use of Funds
- Program Management
- Applicable Policy
- Procedures
- Reporting Requirements

3.4.3 Program Cooperative Agreement

The USACE is currently developing a model Program Cooperation Agreement (PCA) to govern FKWQIP implementation. The PCA will be executed between the Federal Sponsor (USACE) and the Non-Federal Sponsor (SFWMD). The Non-Federal Sponsor may or may not then execute sub-agreements with the municipalities of Monroe County,

including the County itself. Subject to the procedures established in the executed PCA, funds appropriated for the FKWQIP will be used to execute agreements for selected design and construction assistance projects. All work will be performed within available funds. The draft agreement is being prepared to address FKWQIP issues that will evolve as the program is implemented in future years.

Before entering into the PCA, the USACE will ensure the non-Federal Sponsor has completed adequate planning and design activities, as appropriate. The USACE will ensure the non-Federal Sponsor has completed a financial plan for each project approved by the Program Delivery Team (PDT) for Federal funding and has identified and secured the financial sources for the non-Federal portion of each project. Additionally, the USACE will ensure that each project or project component implemented under the program complies with applicable growth management ordinances of Monroe County, Florida; applicable agreements between Monroe County, Florida, and the State of Florida to manage growth in Monroe County, Florida; and applicable water quality standards. Also, the USACE will ensure all projects selected for Federal funding are consistent with the master wastewater and stormwater plans prepared for Monroe County, Florida.

3.4.4 Independent Technical Review Process

An Independent Technical Review (ITR) is required for USACE planning projects. This is a part of the USACE Headquarters level policy and is further defined by USACE Engineer Regulations. ITR is part of the corporate QC/QA process followed by USACE for all engineering projects. QC is comprised of peer reviews, normal technical review and the ITR. In general, QA oversight is for areas of responsibility (and governance) outside the authority assigned to the PDT. All planning, engineering and design products shall have an ITR. The ITR team will be established prior to work starting on individual projects and will conduct reviews as necessary to insure that the product is consistent with established criteria, guidance, regulations, procedures, and policy. The ITR process implemented for the FKWQIP will be a continuous process with reviews coordinated with the appropriate project manager to minimize lost planning and design effort.

3.4.5 Contracting and Acquisition Plan

A general contracting strategy for the FKWQIP will be outlined and included in the PCA that will be utilized for implementing subsequent phases of the FKWQIP. Contracting and acquisition strategies to be utilized during design and construction phases will be developed in subsequent updates of this PMP.

Contract specific acquisition strategies will be developed for each individual project to be advertised and awarded. Procurement statutes, regulations and procedures applicable to the procuring Agency (SFWMD, Monroe County, or municipalities with Monroe County) will dictate the acquisition process. Factors to be considered in determining the specific acquisition strategies include but are not limited to technical complexity of the work, environmental considerations/constraints, construction schedules and magnitude of

construction. Socioeconomic statutes, regulations and procedures applicable to the respective procuring Agency will be applied to the procurement process for each individual project.

3.4.6 Design Process

A detailed scope of work will be determined during the design phase of each project with the FKWQIP. The scope of design investigations to be conducted will be determined jointly by the USACE and the SFWMD during PDT meetings to include sufficient engineering, economic, environmental, and institutional analyses and public involvement activities necessary to implement the project in compliance with applicable Federal and state laws.

In selecting projects for funding under criteria contained within Section 109, the USACE will consider whether a project will have substantial water quality benefits relative to other projects under consideration. Sufficient analysis, coordination, and documentation will be prepared to comply with applicable Federal environmental laws, statutes, and Executive Orders and to provide a basis for obtaining the necessary permits and licenses for project implementation. Using information provided by the SFWMD, the USACE will develop and coordinate as required, an Environmental Assessment and Finding of No Significant Impact or a Supplemental Environmental Impact Statement and Record of Decision in accordance with the National Environmental Policy Act (NEPA) of 1969 for each Federally funded project or program component. This project specific NEPA documentation will include tiering off the program level NEPA documentation currently under preparation. The non-Federal Sponsor is responsible for obtaining all necessary permits and licenses.

Whether the design phase of the project takes the form of a grant, design assistance, or partial cost-reimbursement for design performed by non-Federal interests, the end product will be a set of plans and specifications suitable for the advertisement and award of a construction contract for the identified project. The design phase will also produce documentation of the engineering, economic, environmental, and institutional analyses and public involvement activities necessary to implement the project. Requirements include preparation of either an Environmental Assessment and Finding of No Significant Impact or a Supplemental Environmental Impact Statement and Record of Decision that tiers from the Programmatic Environmental Impact Statement currently under preparation for NEPA compliance and obtaining all the necessary permits required for project implementation.

3.4.7 Real State Acquisition

Credit for real estate acquisition associated with the purchase of lands by the non-Federal Sponsor is not currently reimbursable under terms of the enabling legislation, thus is not subject to review by the USACE. If however, in the future, a determination is made that real estate purchases are reimbursable, the USACE will conduct a real estate evaluation

to insure that fair market value was received for purchased property needed to construct the wastewater and stormwater treatment facilities.

If a real estate analysis is needed in the future, an inventory of all lands adjacent to the project improvements, followed by a list of lands to be acquired for each specific wastewater or stormwater improvement project will be developed. An appraisal of the costs of lands and damages, and preparation of a plan for acquisition of these lands will also be reviewed. Other tasks include an analysis of physical takings, attorney's opinion of compensability, and obtaining rights of entry for various field collection activities. This activity includes all written memoranda, opinions, database development reports and other document provided by Real Estate personnel as required in support of feasibility phase planning efforts and eventually the purchase of the necessary land and rights-of-way.

3.4.8 Construction Activities

For construction phase work for which the non-Federal Sponsor will be responsible, the non-Federal Sponsor is responsible for development and approval of all products pertaining to the performance of work (whether performed under contract or by non-Federal Sponsor personnel) and will provide the USACE with an opportunity to review such products. The non-Federal Sponsor will also prepare and furnish to the USACE for review a proposed Operation, Maintenance, Repair, Rehabilitation and Replacement (OMRR&R) Manual. If at any time the USACE is responsible for construction, it will be responsible for development and approval of all contract products and the OMRR&R Manual and will provide the non-Federal Sponsor an opportunity to review such products.

3.4.9 Reimbursement

The cumulative project financial commitments will be limited to actual appropriations up to the authorized amount of \$100M Federal dollars. Assistance that involves credits or reimbursements to the non-Federal Sponsor is subject to the requirements established in the implementing legislation (i.e., Public Law 106-554 of 2001 and the executed PCA.

Subject to the availability of Federal funding, and execution of the PCA between the non-Federal Sponsor and the USACE, the non-Federal Sponsor will be reimbursed for the non-Federal share of previous design, future design, or future construction work performed by the non-Federal Sponsor, to the extent the credited value of the non-Federal Sponsor's total contributions to the project exceed its required cost share. Creditable prior design is limited to work specifically completed for projects selected by the PDT to be funded by the USACE, or separable components for which assistance is being provided. Credit for design which occurred before the law was enacted (21 December 2001) is not allowable. Likewise, reimbursement for past construction is not authorized. The amount of the credit to be afforded for non-Federal work shall be determined as specified in the executed Program Cooperative Agreement.

The USACE will process reimbursement payments based on proper invoices submitted by the non-Federal Sponsor. If there are unforeseen delays in making reimbursement, reasonable interest and financing charges will be credited to the non-Federal Sponsor by the Government. The amount of the interest and financing charges creditable shall be limited to the amount computed in accordance with the provisions of the Prompt Payment Act.

Federal costs for review of existing design performed by non-Federal interests, developing the scope of work, financial analysis, NEPA compliance, and negotiating the construction agreement will be included in the total project cost that is subject to cost sharing. All Federal and non-Federal costs incurred subsequent to execution of the agreement will be included in total project costs and subject to cost sharing, crediting, and reimbursement under the terms of the construction agreement.

4.0 PROGRAM SCHEDULE

The program schedule has been developed assuming funding of \$100 million appropriations over four years as follows:

Fiscal Year 2004	\$26.3 Million
Fiscal Year 2005	\$38.6 Million
Fiscal Year 2006	\$19.7 Million
Fiscal Year 2007	\$15.4 Million

For the projects contained in the Initial Project List, a program level schedule has been developed which considers work completed to date and includes any required planning, preparation of Requests for Proposal, advertisement for bid, bid review and award, and design and construction.

LIST OF ACRONYMS

ATU	Advanced Treatment Unit
AWT	Advanced Wastewater Treatment
BAT	Best Available Technology
BCC	Board of County Commissioners
BLS	Below Land Surface
BMPs	Best Management Practices
BOD5	Biological Oxygen Demand
CCAM	Carrying Capacity Analysis Model
CERP	Comprehensive Everglades Restoration Plan
CWA	Clean Water Act
DBOWMS	Design/Build/Operate Wastewater Management System
DCIA	Directly Connected Impervious Area
EA	Environmental Assessment
ENRCCI	Engineering News Record Construction Cost Index
EPA	Environmental Protection Agency
FAS	Floridian Aquifer System
FB	Florida Bay
FDEP	Florida Department of Environmental Protection
FEMA	Federal Emergency Management Agency
FK	Florida Keys
FKAA	Florida Keys Aqueduct Authority
FKTR	Florida Keys Tidal Restoration
FKWQIP	Florida Keys Water Quality Improvements Program
FS	Florida Statutes
ITF	Intergovernmental Task Force
ITR	Independent Technical Review
KCA	Kisinger, Campo and Associates Corp
LERR	Land, Easements, Rights-of-way, Relocations
MCSMMP	Monroe County Stormwater Management Master Plan
MCSWMP	Monroe County Sanitary Wastewater Master Plan
MGD	Million Gallons per Day
MOU	Memorandum Of Understanding
NEPA	National Environmental Policy Act
O&M	Operation & Maintenance
OMRR&R	Operation, Maintenance, Repair, Rehabilitation and Replacement
OWNRS	Onsite Wastewater Nutrient Reduction Systems
PCA	Project Cooperation Agreement
PDT	Program Delivery Team
PIG	Program Implementation Guidance
PMP	Program Management Plan
QC/QA	Quality Control / Quality Assurances
RFP	Request For Proposal
ROGO	Rate Of Growth Ordinance

SFWMD	South Florida Water Management District
SW	Stormwater
TMDLs	Total Maximum Daily Loads
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
WW	Wastewater
WWTP	Wastewater Treatment Plant

REFERENCES

Water Quality Protection Program for the Florida Keys National Marine Sanctuary: Phase 1 Report". Prepared by the USEPA Oceans and Coastal Protection Divisions. July 1992.

"Water Quality 'Hotspots' in the Florida Keys: Evaluations for Stormwater Contributions". Prepared by Monroe County. July 1999.

Lapointe, B.E., J.D. O'Connell, and G. Garrett. 1990. Nutrient couplings between on-site sewage disposal systems, groundwaters, and nearshore surface waters of the Florida Keys, *Biogeochemistry*, 10:2289-307.

Kruczynski, William L. and Fred McManus. 1999. "Water Quality Concerns in the Florida Keys: Sources, Effects, and Solutions", *The Everglades, Florida Bay, and Coral Reefs of the Florida Keys: An Ecosystem Sourcebook*, 31.

Draft Wastewater Facilities Plan with Phased Implementation for the Marathon Area of the Florida Keys (Marathon Wastewater Facilities Plan). Prepared for Monroe County, Florida by CH2Mhill in association with Lindahl, Browning Ferrari & Hellstrom, Inc. and Continental Shelf Association, Inc. April 1998.

Design/Build/Operate Wastewater Management System (DBOWMS) for the City of Marathon. Prepared for the City of Marathon by the Florida Keys Aqueduct Authority. Key West, Florida. January 2002.

Monroe County Sanitary Wastewater Master Plan. Prepared for Monroe County by CH2Mhill in association with Lindahl, Browning Ferrari & Hellstrom, Inc., Ayers Associates, Hazen and Sawyer, P.C., Katz, Kutter, Haigler, Alderman, Bryant, and Yon, P.A. and Continental Shelf Association, Inc. June 2000.

City of Marathon Reuse Component of Central Wastewater RFP. Prepared for the City of Marathon by Calvin, Giordano & Associates, Inc. May 2001.

City of Key Colony Beach Sewer System Evaluation. Prepared for the City of Key Colony Beach by URS Corporation. September 2002.

Federal Emergency Management Agency Draft Programmatic Environmental Assessment. Prepared for Federal Emergency Management Agency by URS Corporation. September 2002.

Stormwater Runoff Study. Prepared for the City of Key West by Kisinger Campo and Associates, Corporation. September 1994.

City of Key West Water Quality Improvement Program. Developed by the City of Key West. 1999.

Islamorada, Village of Islands, Stormwater Management Master Plan. Prepared by Law Engineering and Environmental Services, Inc. September 2000.

City of Key West Long Range Stormwater Utility Plan. Prepared for the City of Key West by Engineering Services. June 2001.

Monroe County Stormwater Management Master Plan. Prepared for Monroe County by Camp Dresser & McKee, Inc. August 2001.

Stoker, Y.E. "Effectiveness of a stormwater collection and detention system for reducing constituent loads from bridge runoff in Pinellas County, Florida". USGS Open File Report 96-484.

Appendix A

Roster of PDT Members

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Appendix B

Plan Formulation Memorandum

PLAN FORMULATION MEMORANDUM

FLORIDA KEYS WATER QUALITY IMPROVEMENTS PROGRAM

**Prepared by Everglades Partners Joint Venture
February 10, 2003**

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1.0 INTRODUCTION

The Florida Keys (Keys) are a chain of islands extending from the southern tip of the Florida mainland southwest to the Dry Tortugas in portions of both Dade and Monroe counties. Among the many conservation areas in the Keys are Biscayne National Park, several National Wildlife Refuges, and the Dry Tortugas National Park, all of which are encompassed within the larger Florida Keys National Marine Sanctuary (Sanctuary) (Figure 1). The Sanctuary includes 2,800 square nautical miles of nearshore waters that are part of a complex ecosystem that also includes seagrass meadows, mangrove islands, and the only living coral barrier reef in North America. Consequently, water quality is critical to maintaining the marine ecosystem of the Sanctuary.

Importantly, as population and tourism in the Keys have increased over the years, improvements in wastewater treatment and stormwater management practices have not kept pace with this growth. Ongoing research has suggested that this trend has resulted in a significant degradation of water quality in canals and nearshore waters surrounding the Keys and that nutrients commonly found in wastewater and stormwater are one of the major contributors to the decline of water quality.

For these reasons, the U.S. Army Corps of Engineers (Corps) proposes to assist local municipalities in Monroe County with the development and implementation of wastewater and stormwater improvements as part of the Florida Keys Water Quality Improvements Program (FKWQIP or Program). The Program is designed to:

- reduce nutrient loading to the Florida Keys National Marine Sanctuary;
- subsequently improve water quality in the Sanctuary; and,
- meet relevant Federal and State regulatory standards.

The implementation of several wastewater and stormwater treatment master plans prepared for municipalities in Monroe County is integral to the success of the FKWQIP. The purpose of this Plan Formulation Memorandum (Memorandum) is to document the analysis and subsequent recommendations that resulted in the development of these master plans that the Corps will use as the foundation for implementing the Program. The following sections provide information relevant to the Program and the master plans that will be used in its implementation.

1.1 Florida Keys Water Quality Improvement Program

The FKWQIP provides a means of improving the water quality of the Sanctuary. A description of the Program is presented here to provide the context in which the Plan Formulation Memorandum has been developed. The Memorandum is presented in subsequent sections.

1.1.1 Program Location

This program targets the portion of the Keys connected by U.S. Highway 1, a 110-mile stretch of roadway extending from Key Largo to Key West, and the remaining developed portion of the Keys. The entire study area is within the Sanctuary (Figure 1).

1.1.2 Program Purpose

Numerous scientific studies have documented the contribution of failing septic tanks and cesspools to the deterioration of canal and nearshore water quality in the Keys (Lapointe *et al.* 1990 and Kruczynski *et al.* 1999). In addition, research has suggested that increased nutrient loadings from wastewater and deterioration of canal and nearshore water quality are major contributors to the decline of water quality in the Sanctuary. Therefore, the primary purpose of the FKWQIP is to improve the water quality in the Sanctuary by the development and implementation of improved wastewater and stormwater treatment in the Keys.

At the Federal level, the Florida Keys National Marine Sanctuary and Protection Act of 1990 directed the U.S. Environmental Protection Agency (EPA) and the State of Florida to develop a water quality protection plan for the Sanctuary. Locally, the Monroe County 2010 Comprehensive Plan mandates that nutrient loadings be reduced in the marine ecosystem by the year 2010 and that wastewater systems meet more stringent Florida Statutory Treatment Standards. In light of regulatory requirements and in the interest of protecting public health and water quality, the FKWQIP was created.

The FKWQIP will be accomplished through the implementation of several wastewater and stormwater master plans prepared for Monroe County and other local municipalities in Monroe County. These plans are designed to provide cost-effective, environmentally sound, and feasible programs for managing pollutants that are now, or have the potential to, adversely impact the water quality of the Keys and the Sanctuary. The FKWQIP is intended to provide the technical and financial assistance for planning, engineering, and construction of wastewater and stormwater treatment improvement projects.

1.1.3 Program Authorization and Background

Under authority of Public Law 106-554, Departments of Labor, Health and Human Services and Education, and Related Agencies Appropriations Act of 2001, Section 109 and Conference Report H.R. 4577, the Corps is authorized to provide technical and financial assistance to carry out projects for the planning, design and construction of treatment works to improve the water quality of the Sanctuary. It should be noted that programs of this nature (i.e., wastewater treatment and stormwater management construction programs) are not in accordance with Administration Program priorities of the Corps of Engineers; however, the Corps routinely undertakes similar non-traditional Corps projects.

1.1.4 Water Quality Protection Program: *Hot Spots* and *Cold Spots*

In July 1992, the U.S. Environmental Protection Agency Oceans and Coastal Protection Division produced a report entitled *Water Quality Protection Program for the Florida Keys National Marine Sanctuary; Phase 1 Report*. The report was based on workshops and discussions and provided a list of 84 water quality *Hot Spots* with known or suspected water quality degradation. According to a meeting summary dated March 19, 1996, the list of 84 was later expanded to include 88 *Hot Spots* based primarily on water quality issues associated with wastewater influences. In July of 1999, a Monroe County document entitled *Water Quality 'Hotspots' in the*